

WHAT IS CLAIMED IS:

1. Process for carrying out a chemical reaction with fluoropolymer or with a contaminant in a fluoropolymer, comprising

5 (a) melting said fluoropolymer,

(b) contacting said molten fluoropolymer with reactant in isolation from said melting, said contacting being carried out in a reaction zone having free volume,

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(c) subdividing molten fluoropolymer in said reaction zone to enable said reactant to effectively contact said molten fluoropolymer so as to carry out the chemical reaction between said reactant and said molten fluoropolymer,

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(d) devolatilizing the resultant molten fluoropolymer in isolation from (b) and (c), and

(e) cooling the devolatilized fluoropolymer.

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2. The process of claim 1 and additionally sparging said devolatilized fluoropolymer.

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3. The process of claim 1 wherein said molten fluoropolymer of step (a) contains acid end groups or –carboxylate salt end groups and said reactant contains a proton source, said reaction being between said proton source and said end groups to form stable hydride end groups (–CF₂H) on said molten fluoropolymer in step (c).

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4. The process of claim 3 wherein said reactant is water.

5. The process of claim 3 where said reaction zone is free of added oxygen.

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6. The process of claim 1 wherein said molten fluoropolymer of step (a) contains non-perfluorinated end groups and said reactant

contains fluorine, said reaction being between said fluorine and said end groups to form stable fluoromethyl groups ($-\text{CF}_3$).

5 7. The process of claim 1 wherein said molten fluoropolymer of step (a) contains acid end groups and said reactant contains an amine to form amide end groups.

10 8. The process of claim 1 wherein said molten fluoropolymer of step (a) contains acid end groups and said reactant contains ammonia to form $-\text{CONH}_2$ end groups.

15 9. The process of claim 1 wherein said molten fluoropolymer of step (a) contains acid end groups and said reactant contains an alcohol, to form ester end groups.

 10. The process of claim 1 wherein said molten fluoropolymer of step (a) contains contaminant and said reactant converts said contaminant to a volatile form.

20 11. The process of claim 1 wherein the said reactant contains fluorine.

 12. The process of claim 1 wherein the said reactant is elemental fluorine.

25 13. The process of claim 1 wherein the said reactant contains oxygen.

30 14. The process of claim 1 wherein said subdividing includes countercurrent flow of streams of said molten fluoropolymer in said reaction zone.

35 15. The process of claim 1 wherein said subdividing includes dividing said molten fluoropolymer in said reaction zone into at least 6 streams of molten fluoropolymer a plurality of times within said reaction zone.

16. The process of claim 1 wherein said subdividing is equivalent to said fluoropolymer containing -COOH end groups and said reactant being water to obtain stable $\text{-CF}_2\text{H}$ end groups without degrading said fluoropolymer.

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17. The process of claim 16 wherein the resultant fluoropolymer has a whiteness index of at least about 60.

18. The process of claim 16 wherein said fluoropolymer is
10 tetrafluoroethylene/hexafluoropropylene copolymer and sparging said copolymer to obtain said copolymer having a backbone volatiles index of no greater than about 30.

19. The process of claim 1 when said subdividing is characteristic
15 of dispersive mixing.